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EXAMINER

HILTON, ALBERT

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PAPER

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte GUAN-SHIAN CHEN
and MICHAEL X. YANG

Appeal 2010-004611
Application 10/770,737
Technology Center 1700

Before ADRIENE LEPIANE HANLON, CHARLES F. WARREN, and
CATHERINE Q. TIMM, *Administrative Patent Judges*.

WARREN, *Administrative Patent Judge*.

DECISION ON APPEAL¹

Applicants appeal to the Board from the decision of the Primary
Examiner finally rejecting claims 21-24 and 26-28 in the Office Action

¹ The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, or for filing a request for rehearing, as recited in 37 C.F.R. § 41.52, begins to run from the “MAIL DATE” (paper delivery mode) or the “NOTIFICATION DATE” (electronic delivery mode) shown on the PTOL-90A cover letter attached to this decision.

mailed January 8, 2009. The Examiner subsequently refused to allow claims 26-28 as amended in the Amendment filed March 9, 2009 (Amendment), which was entered in the Advisory Action mailed March 23, 2009. The Amendment also canceled claims 21-24, leaving claims 26-28 on appeal. 35 U.S.C. §§ 6 and 134(a) (2002); 37 C.F.R. § 41.31(a) (2008).

We affirm the decision of the Primary Examiner.

Claim 26 illustrates Appellants' invention of an electroless processing system, and is representative of the claims on appeal:

26. An electroless processing system, comprising:

a factory interface having a substrate transfer robot positioned therein, the factory interface being configured to communicate with at least one substrate containing cassette; and

at least two substrate processing modules in detachable communication with the factory interface, each of the at least two substrate processing modules including a pretreatment/post treatment cell and an electroless processing cell, wherein the at least two substrate processing modules are interchangeable.

Appellants request review of the grounds of rejection under 35 U.S.C. § 103(a) advanced on appeal by the Examiner: claims 26-28 over Hongo '466 (US 6,921,466 B2) in view of Hongo '330 (US 6,716,330 B2); and claims 26-28 over Hongo '466 in view of Dordi (US 6,267,853 B1). App. Br. 9;² Ans. 3 and 6.

To the extent Appellants have separately argued the individual claims on appeal, we will address them separately consistent with the requirements of 37 C.F.R. § 41.37(c)(1)(vii) (2008).

² We considered the Appeal Brief filed June 2, 2009 (App. Br.), as modified by the Appeal Brief filed July 20, 2009.

Opinion

I

The issues in this appeal entail the interpretation of the appealed claims which are represented by claim 26. We determine that, as illustrated in Specification Figures 1 and 2, claim 26 encompasses an electroless processing system comprising at least factory interface 101 having a substrate transfer robot 104 and is configured to communicate with at least one substrate containing cassette 103. The factory interface 101 has at least two substrate processing modules 102 in detachable communication therewith, wherein each of the substrate processing modules 102 includes at least a pretreatment/post treatment cell 201 and an electroless processing cell 202. The substrate processing modules 102 are interchangeable. Spec., e.g., ¶¶ 0015 and 0017. The pretreatment/post treatment cell 201 must perform at least one pretreatment or post treatment processing step. Spec. ¶ 0017, ll. 2-5, 12-17, 21-27. Claims 27 and 28 specify electroless processing systems which have the same components as specified in claim 26. In claim 27, the pretreatment/post treatment cells 201 are interchangeable within the system. In claim 28, the electroless processing cells 202 are interchangeable within the system.

II

Appellants submit that the Examiner erred in determining that the claimed electroless processing system encompassed by claims 26-28 would have been obvious to one of ordinary skill in the art over the teachings of Hongo '466 combined with Hongo '330. App. Br. 10. Appellants contend that it is the Examiner's position that Hongo '466 describes a system having

two processing modules as illustrated in Figure 47 but does not teach a module that includes a pretreatment/post treatment cell and an electroless processing cell, and that it would have been obvious to combine an electroless plating cell of Hongo '330 with the system of Hongo '466 Figure 47 to meet the limitations of the claims. App. Br. 10.

Appellants contend that Hongo '466 Figure 47 illustrates a plating apparatus that has two plating modules 512, 512 that are not interchangeable because they have mirror image shapes. App. Br. 10; Reply Br. 5.

Appellants contend that Hongo '466 uses the term “interchangeable” to describe measuring units 141, 142, 146 in the substrate processing apparatus illustrated in Figure 31 and measuring unit 405 in the substrate processing apparatus illustrated in Figure 42, but not with respect to the plating modules 512, 512 in Figure 47. App. Br. 11, citing Hongo '466 col. 34, ll. 7-11, and col. 44, ll. 24-26. Thus, Appellants contend that the two modules 512, 512 in Hongo '466 Figure 47 “are not interchangeable even if each module could be replaced by similar modules having different functions.” App. Br. 11.

Appellants further contend that, contrary to the Examiner's position, Hongo '466 does not teach a processing module having a pretreatment/post treatment cell 201 and an electroless processing cell 202. Reply Br. 3.

Appellants contend that the apparatus illustrated in Hongo '466 Figure 31 “teaches that units 111-118 and measuring units 141-143 . . . are interchangeable,” of which units 111, 112 are electroless plating apparatus and “unit 112 is configured for electroless plating, cleaning, and drying in the same cell.” Reply Br. 3, citing Hongo '466 cols. 33-34, col. 37,

ll. 23-65, and Figs. 31 and 36; *see also* Reply Br. 5. With respect to the Examiner's contention that Hongo '466 Figure 14 illustrates substrate treatment section 2-1 of plating unit 2 that is capable of dispensing electroless plating solution, Appellants contend that plating unit 2 does not include a pretreatment/post treatment cell because, as shown in Hongo '466 Figure 12, plating liquid tray section 2-2 is not a treatment cell. Reply Br. 3-4. Appellants further point out that, contrary to the Examiner's position that the apparatus illustrated in Hongo '466 Figures 47 and 49 show a combination of cells, plating unit 2 in Hongo '466 Figures 12-16 and plating module 512 in Hongo '466 Figures 47 and 49 have one substrate treatment section 2-1 and one plating liquid storage tray 2-2, and thus does not teach the claimed processing modules including a pretreatment/post treatment cell and an electroless processing cell. Reply Br. 4.

Appellants contend that Hongo '330 illustrates a substrate processing apparatus in Figure 4 which shows electroless plating apparatus 62 as a stand alone component of the substrate processing apparatus, and thus, Hongo '330 does not teach "a system having two or more processing module [sic] each comprising an electroless processing cell and a pretreatment/post treatment cell" as claimed in claim 26. App. Br. 11. Appellants contend that the substrate processing apparatus of Hongo '330 Figure 4 includes a number of separate pretreatment apparatus 54, 58, 60, electroless plating apparatus 62, and separate post treatment apparatus 64, 66, and thus Hongo '330 does not teach a claimed processing module that includes a pretreatment/post treatment cell and an electroless processing cell. Reply Br. 4, citing Hongo '330 col. 8, l. 63 to col. 9, l. 10.

Thus, Appellants contend the combination of Hongo '466 and '330 does not teach the claimed electroless processing system encompassed by claim 26, and rely on the same position with respect to claims 27 and 28. App. Br. 11-12.

III

Appellants submit that the Examiner erred in determining that the claimed electroless processing system encompassed by claims 26-28 would have been obvious to one of ordinary skill in the art over the teachings of Hongo '466 combined with Dordi. App. Br. 13. Appellants contend that it is the Examiner's position that the combination of Hongo '466 Figure 31 and Dordi teaches a module that includes a pretreatment/post treatment cell and an electroless processing cell. App. Br. 13.

Appellants contend that Hongo '466 illustrates in Figure 31 a system that has stand alone processing units 111-118, of which barrier layer forming unit 111 can be an electroless plating unit and is not in detachable communication with a factory interface. App. Br. 13, citing Hongo '466 col. 34, ll. 29-40. Appellants contend that Dordi illustrates in Figure 17 "an electroless deposition cell rinse and spin dry a substrate by positioning the substrate at different elevation." App. Br. 13, citing Dordi col. 13, l. 25 to col. 14, l. 23. Appellants contend the combination of Hongo '466 and Dordi does not teach the claimed electroless processing system encompassed by claim 26, and rely on the same position with respect to claims 27 and 28.

IV

We cannot agree with Appellants that the Examiner erred in

determining that the claimed electroless processing system encompassed by claims 26-28 would have been obvious to one of ordinary skill in the art over the combined teachings of Hongo '466 with Hongo '330 and with Dordi. As the Examiner points out, Hongo '466, common to both grounds of rejection, teaches that units of the described substrate processing apparatus are adapted to be interchangeable for the purpose of renewing the function of the entire apparatus "at a low cost in a short time." Ans. 4. Hongo '466 col. 5, ll. 62-65. As the Examiner further points out and as Appellants acknowledge, Hongo '466 illustrates the unit interchangeability objective in describing the processing units and measuring units of the substrate processing apparatus shown in Figure 31. Ans. 4. Hongo '466 col. 34, ll. 7-11.

Indeed, Hongo '466 would have taught one of ordinary skill in this art that the processing units of the substrate processing apparatus must be detectable from and interchangeable in the apparatus as well as aligned with transfer robots to provide efficient substrate transfer between units of the apparatus. Hongo '466, e.g., cols. 34-35 and Fig. 31 (robots 131, 132, 133, 134); col. 53, l. 55 to col. 54, l. 45, and Fig. 47 (robot 514); and col. 55, l. 64 to col. 56, l. 51, and Fig. 49 (robots 514a, 514b). In this respect, we determine that, contrary to Appellants' position, one of ordinary skill in the art following the teachings of Hongo '466 would have used two plating modules 512, 512 of the same unit configuration in place of the mirror image plating modules 512, 512 in the plating apparatus illustrated in Hongo '466 Figure 47 in order to have just one plating module 512 configuration,

thus increasing facility and lowering cost in renewing the plating apparatus as taught by the reference.

We agree with Appellants that Hongo '466, Hongo '330, and Dordi do not show a unit or module of a substrate processing apparatus which includes a pretreatment/post treatment cell and an electroless processing cell as the references show pretreatment and post treatment stand alone units or modules. However, as the Examiner points out and Appellants acknowledge, the pretreatment and post treatment units or modules are used in proximity to electroless plating units in the substrate processing apparatus in each of the references. Ans. 4-5, 6-7, and 8-9. *See* Hongo '466, e.g., col. 33, l. 59 to col. 34, l. 16, and Fig. 31; Hongo '330, e.g., col. 8, l. 62 to col. 9, l. 20, and Fig. 4; Dordi, e.g., col. 11, l. 64 to col. 12, l. 29, and Fig. 3. We further find that, as the Examiner points out, Hongo '466 and Dordi teach that at least two units can be employed in the same module, even though the units perform the same function. Hongo '466 col. 53, ll. 55-65, and Fig. 47; Dordi col. 11, l. 64 to col. 12, l. 29, and Fig. 3 (modules 215, 218, 218, 212). Dordi points out that side-by-side arrangements provide greater throughput rates. Dordi col. 12, ll. 27-29.

With respect to the combined teachings of Hongo '466 with Hongo '330 and with Dordi, we are of the opinion that one of ordinary skill in the art could have combined a pretreatment and/or post treatment unit(s) and an electroless plating unit into the same module. This is because this person would have recognized that each of the separate pretreatment and/or post treatment unit(s) and an electroless plating unit can be formed into one structure as a matter of design with the objective of facilitating and lowering

the cost of renewing the plating apparatus as taught by Hongo '466. We are reinforced in our view by the teachings of Hongo '466 and of Dordi that at least two units can be employed in the same module, even though the units perform the same function, for the purpose of obtaining greater throughput rates with the side-by-side arrangements. Indeed, with respect to the combined teachings of Hongo '466 and Dordi, one of ordinary skill in this art following the teachings of Dordi would have recognized that having a pretreatment/post treatment cell and an electroless plating cell together would provide the advantage of increased throughput in addition to the advantages of facilitating and lowering the cost of renewing the plating apparatus taught by Hongo '466. *See, e.g., KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007) (“When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense.”); *In re Kahn*, 441 F.3d 977, 986-88 (Fed. Cir. 2006); *In re Sovish*, 769 F.2d 738, 743 (Fed. Cir. 1985) (skill is presumed on the part of one of ordinary skill in the art); *In re Keller*, 642 F.2d 413, 425 (CCPA 1981) (“The test for obviousness is . . . what the combined teachings of the references would have suggested to those of ordinary skill in the art.”); *see also, e.g., In re O’Farrell*, 853 F.2d 894, 903-04 (Fed. Cir. 1988) (“For obviousness under § 103, all that is required is a reasonable expectation of success.” (citations omitted)).

Accordingly, based on our consideration of the totality of the record

before us, we have weighed the evidence of obviousness found in the combined teachings of Hongo '466 with Hongo '330 and with Dordi with Appellants' countervailing evidence of and argument for nonobviousness and conclude, by a preponderance of the evidence and weight of argument, that the claimed invention encompassed by appealed claims 26-28 would have been obvious as a matter of law under 35 U.S.C. § 103(a).

The Primary Examiner's decision is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

Ssl

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